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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/885,678	06/20/2001	Mohammed N. Islam	069204.0107	6371

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07/15/2003

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EXAMINER

LEE, JOHN D

ART UNIT

PAPER NUMBER

2874

DATE MAILED: 07/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/885,678

Applicant(s) **AD**

ISLAM ET AL.

Examiner

John D. Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-123 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-11, 13-20, 22-37, 51-56, 69-75, 77-106, 114-116 and 118-123 is/are allowed.
- 6) ☒ Claim(s) 12, 21, 38-50, 57-63, 65-67, 76, 107, 109 and 117 is/are rejected.
- 7) ☒ Claim(s) 64, 68, 108 and 110-113 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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The six (6) sheets of formal drawing filed with this application are acceptable.

The oath or declaration contains a minor informality, in that it states "single" inventorship when, in fact, there is "joint" inventorship. The undersigned Examiner has waived this deficiency, and a new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is **not** required. See MPEP §§ 602.01 and 602.02.

The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claims 14, 96 and 101 are objected to because of the following minor informalities: in the next-to-last line of claim 14, "and a" should be deleted; in line 16 of claim 96, the word "direction" should appear after "second"; and in the fourth line of claim 101, the word "a" should be deleted. Appropriate correction is required.

The following is a quotation of the second paragraph of 35 U.S.C. § 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 12, 21, 38-50, 57-61, 66, 67, 76, and 117 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 12, lines 5-6 and 8, there is no antecedent support for the terms "the first polarization" and "the second polarization", respectively, thus rendering the claim indefinite. It is believed that claim 12 is intended to depend from claim 11 rather than from claim 1. In claim 21, lines 5-6 and 8, there is no antecedent support for the terms "the first polarization" and

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"the second polarization", respectively, thus rendering the claim indefinite. It is believed that claim 21 is intended to depend from claim 20 rather than from claim 14. In line 14 of claim 38, there is no antecedent support for the term "the optical gain medium" because of the word "gain" (note the original recitation in line 2 of this claim). Claim 38, along with all claims dependent thereon, is therefore indefinite. In line 14 of claim 57, there is no antecedent support for the term "the optical gain medium" because of the word "gain" (note the original recitation in line 2 of this claim). Claim 57, along with all claims dependent thereon, is therefore indefinite. Claim 61 is indefinite because it refers to the "multiple wavelength converter of claim 51", when it should refer to the "system of claim 51". In line 14 of claim 66, there is no antecedent support for the term "the optical gain medium" because of the word "gain" (note the original recitation in line 2 of this claim). Claim 66 is therefore indefinite. In claim 67, lines 1-2, there is no antecedent support for the term "the optical medium", thus rendering the claim indefinite. It is believed that the stated dependency of claim 67 is incorrect. In line 14 of claim 76, there is no antecedent support for the term "the optical gain medium" because of the word "gain" (note the original recitation in line 2 of this claim). Claim 76 is therefore indefinite. In claim 117, lines 1 and 3, there is no antecedent support for the terms "the first band" and "the second band", respectively, thus rendering the claim indefinite. The correct terms would be "the first set" and "the second set".

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 62 is rejected under 35 U.S.C. § 102(b) as being clearly anticipated by U.S. Patent 3,746,879 to Esaki et al. Esaki et al discloses a system operable to convert a plurality of wavelengths, the system comprising a plurality of optical transmitters which generate a plurality of optical input signals (each comprising an individual wavelength), and a multiple wavelength converter coupled to the transmitters for generating (for each of the plurality of optical input signals) a converted wavelength. The "wavelength band" of the optical input signals (the fundamental band) is different from the "wavelength band" of the converted signals (the harmonic band).

Claim 63 is rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 3,746,879 to Esaki et al. Although the "wavelength bands" of the Esaki et al system (see the immediately preceding paragraph) are not defined as comprising the C-band, the S-band, or the L-band of wavelengths, to tailor the system so that wavelengths fall into any of these bands would have been within the level of ordinary skill of the artisan at the time of applicant's invention. Defining particular wavelengths would not change the scope and the inventive aspects of the Esaki et al system.

Claims 65, 107, and 109 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 3,746,879 to Esaki et al in view of U.S. Patent 5,940,206 to Kuroda et al. Esaki et al shows a plurality of optical input signals and a plurality of converted harmonic signals, but does not show a separately labeled "pump" signal. One well known way of generating harmonic signals through standard non-linear optical interactions is the use of an optical pump signal, along with input optical probe and idler signals, as shown by the Kuroda et al reference. Therefore, it would have been obvious to a person of ordinary skill in the art, at the time of applicant's invention, to use an optical pump signal in the system of Esaki et al in order to help generate the plurality of converted harmonic signals.

Claims 1-11, 13-20, 22-37, 51-56, 69-75, 77-106, 114-116, and 118-123 are allowed.

Claims 64, 68, 108, and 110-113 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 12, 21, 38-50, 57-61, 76, and 117 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. § 112, second paragraph, set forth in this Office action.

Claims 66 and 67 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. § 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

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The following is a statement of reasons for the above indication of allowable subject matter: The prior art (of which the U.S. Patents to Esaki et al and Kuroda et al appear to be the closest to the claimed invention) does not disclose or reasonably suggest a plural wavelength optically nonlinear conversion system of the type claimed wherein the cross-talk between the converted wavelengths is less than minus fourteen decibels (-14 dB) over a wavelength range of at least seven (7) nanometers, or wherein the polarization sensitivity of the wavelength converter is less than 1.2 decibels (1.2 dB) over a wavelength range of at least seven (7) nanometers. The prior art also does not disclose or reasonably suggest a plural wavelength optically nonlinear conversion system of the type claimed wherein a polarization beam splitter is employed to receive a plurality of input optical signals and to communicate a first portion of those signals comprising a first polarization in one direction, and to communicate a second portion of those signals comprising a second polarization in a second direction, and wherein an optical medium is employed to propagate a first pump signal comprising approximately the first polarization and the first portions of the input signals in a first direction and to propagate a second pump signal comprising approximately the second polarization and the second portions of the input signals in a second direction. The prior art further does not disclose or reasonably suggest a plural wavelength optically nonlinear conversion system of the type claimed wherein the converted set of wavelengths comprises a protection path for the input set of wavelengths operable to be utilized in the event of detection of a fault associated with a communication path being used.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Other plural converted wavelength optically nonlinear conversion systems can be seen in the cited U.S. Patents to Kozlovsky et al, Kikuchi, Galvanauskas et al, and Richman et al.

All of the prior art documents submitted by applicant in the Information Disclosure Statement filed on September 11, 2002, have been considered and made of record (note the attached initialed copy of form PTO-1449).

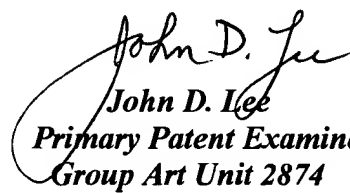
This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103(a), the Examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR § 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the Examiner to consider the applicability of 35 U.S.C. § 103(c) and potential 35 U.S.C. §§ 102(e), (f) or (g) prior art under 35 U.S.C. § 103(a).

Any inquiry concerning the merits of this communication should be directed to Examiner John D. Lee at telephone number (703) 308-4886. The Examiner's normal work schedule is Tuesday through Friday, 6:30 AM to 5:00 PM. Any inquiry of a general or clerical nature (i.e. a request for a missing form or paper, etc.) should be directed to the Technology Center 2800 receptionist at telephone number (703) 308-0956, to the technical support staff supervisor (Team 2) at telephone number (703) 308-3072, or to



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the Technology Center 2800 Customer Service Office at telephone number (703) 306-3329.

  
**John D. Lee**  
**Primary Patent Examiner**  
**Group Art Unit 2874**